

WHAT IS CLAIMED

1. An apparatus for supplying and sanitizing the water line of a dental unit, such water line being of the type comprising:

    a main fluid supply line connected at one end to at least one source of a first fluid and at the other end to the dental unit through at least one first branch for supplying a set of use-points comprising a plurality of handpieces;

    first shutoff elements each located on the first branch that supplies the handpieces and each designed to turn on the supply of a handpiece when required;

the apparatus comprising:

    at least one second branch connected and leading into the first branch supplying the use-points and conveying a second disinfectant / sterilizing fluid into the main line, the second branch and the main line being equipped with respective second and third shutoff elements designed to switch the supply of the first branch between the first fluid or the second disinfectant / sterilizing fluid coming from the second branch;

a first container for holding the handpieces or the ends of the conduits connecting with the dental unit during sterilization, disinfection, flushing or cleaning of the water line; and

switching means connected to control means that can be operated manually or triggered automatically upon the occurrence of defined events on the dental unit and, depending on the type of treatment, designed to determine successive manual or automatic operating combinations and/or sequences that may be repeated two or more times, during which the first, second and third shutoff elements are opened and closed in such a way as to perform cycles of treatment on the first branch with the first fluid and/or alternatively with the second fluid conveyed by the second branch.

2. The apparatus according to claim 1, wherein the switching means act on each of the first shutoff elements according to the following single sequence of operations:

opening for a preset time and/or quantity of first or second fluid until the first branch is full of the selected fluid and the fluid is discharged from the handpieces; and

closing of the first shutoff elements.

3. The apparatus according to claim 1, wherein the switching means act on each of the first, second and third shutoff elements in such a way as to perform the following operations in succession:

switching the supply of the first branch from the main line to the second branch through a combination or succession of operations to close the third shutoff element on the main line and to open the second shutoff element on the second branch;

opening the first shutoff elements for a preset time or quantity of fluid, so as to create a preset flow of the second fluid from the second branch into the first branch, and thus completely renewing the fluid in the first branch with the flow of the second fluid from the second branch until the second fluid is discharged from the handpieces;

closing the first shutoff elements after a preset time or when a preset quantity of fluid is finished;

further switching the supply of the first branch from the second branch to the main line through a combination or succession of operations

to close the second shutoff element on the second branch and to open the third shutoff element on the main line so as to return to the condition in which the first branch is supplied with the first fluid;

opening the first shutoff elements for a preset time or quantity of fluid, so as to create a preset flow of the first fluid into the first branch, and thus completely flushing the first branch with the first fluid until the first fluid is discharged from the handpieces;

closing the first shutoff elements after a preset time or when a preset quantity of fluid is finished.

4. The apparatus according to claim 1, wherein the first container for the handpieces forms part of the dental unit, being built into or mounted on the body of the dental unit, and is equipped with a conduit leading into a drain.
5. The apparatus according to claim 1, wherein the first container for the handpieces is a separate part applied to or positioned near the dental unit when treatments are being performed on the first fluid supply branch.

6. The apparatus according to claim 1, wherein the second branch is supplied by a first tank which is independent and/or interchangeable.
7. The apparatus according to claim 1, further comprising a third branch that supplies an alternative third fluid, used instead of the first fluid, in the main line and in the first connecting branch, the third fluid being contained in a corresponding second tank.
8. The apparatus according to claims 1 and 7, wherein the second and third branches are equipped with respective closures used to connect up the first and second tanks of the fluids to be supplied and with respective tubes connected to the second and third branches, each tube being inserted into the corresponding tank to draw the fluid from inside it on a control from the first control means.
9. The apparatus according to claim 8, wherein the second supply branch starts at the corresponding closure and connects directly to the third branch closure immediately downstream of the

corresponding tube, so that the disinfectant/sterilizing fluids and the alternative fluid used instead of the first fluid can, thanks to the second control means, be supplied alternately through a single second branch, which is connected to the main line.

10. The apparatus according to claim 9, wherein the second branch (7) extends from the corresponding closure and connects directly to the closure of the third branch that supplies the alternative fluid.

11. The apparatus according to claim 8 or 9, wherein the closures are fitted, at the top end of each of the tubes, with respective valve elements designed to operate in conjunction with the second control means to enable the corresponding fluid to flow, when required, into the single second branch.

12. The apparatus according to claim 10 or 11, wherein the closure of the second branch that supplies the disinfectant / sterilizing fluid has a channel connected to the third branch to convey the fluid in the direction of the other closure.

13. The apparatus according to claim 9, wherein the closure of the third branch that supplies the alternative fluid has a T-channel to allow the fluids to flow alternately into the main line.
14. The apparatus according to claim 11, wherein the closures are equipped with respective non-return valves, at the top ends of the respective tubes.
15. The apparatus according to claim 1, wherein the second means for controlling the supply of each of the fluids comprise an air channel made in each of the closures operated by an appropriate unit designed to generate pressure inside the respective tanks so as to allow the supply of the selected fluid.
16. The apparatus according to claim 8, wherein the second branch connecting the two closures is equipped with second valve means designed to safely shut off the second branch when the alternative fluid is being used.
17. The apparatus according to claim 7, wherein the alternative fluid is purified water.

18. The apparatus according to claim 7, wherein the alternative fluid is purified water with patient-specific drugs added.

19. The apparatus according to claim 7, wherein the alternative fluid is a sterile, isotonic, saline fluid.

20. The apparatus according to claims 6 and 7, wherein the first and second tanks are of the disposable type.

21. The apparatus according to claims 6 and 7, wherein the first and second tanks are of the type that can be sterilized and reused.

22. The apparatus according to claim 1, where the dental unit is equipped with a microprocessor to control its main and auxiliary functions, wherein the control means, consisting of a pushbutton located on the dental unit, are controlled by the microprocessor in such a way as to allow the coordinated opening and closing of the first, second and third shutoff elements according to preset parameters that can be stored in the

microprocessor and that control the flow time and/or the quantity of the fluid.

23. The apparatus according to claim 22, wherein the first control means are activated by the microprocessor according to defined parameters dependent on events performed on/by the dental unit.

24. The apparatus according to claim 1, wherein the control means consist of a pair of pushbuttons located on the dental unit, one of which is connected to settable timing means that are activated when the first shutoff elements open or close or when the main line is full and that are designed to re-close or re-open the shutoff elements when the preset time has elapsed; the other pushbutton being connected to the second and third shutoff elements and being designed to switch from one to the other according to the treatments to be performed.

25. The apparatus according to claim 1, wherein each of the first, second and third shutoff elements is connected to an operating unit constituting

the switching means connected to the control means.

26. The apparatus according to claim 1, where the first fluid supply branch comprises, as one of the patient use-points, a fourth branch that supplies a fluid to a tumbler and that is equipped with a fourth shutoff element, wherein the control means are also connected to the fourth shutoff element of the fourth branch, which is equipped with a switching unit so that the fourth branch can be treated in the same way as the other branches.